

CLAIM AMENDMENTS

29. (Previously Presented) A rechargeable electrochemical cell which is subjected to multiple charging cycles and discharging cycles, each charging cycle having a charging portion corresponding to a gassing charge where a gas is generated in the rechargeable electrochemical cell and a charging portion below the gassing charge, the rechargeable electrochemical cell comprising;

opposed positive and negative electrodes;

an aqueous electrolyte in ionic contact with the electrodes for supporting current flow therebetween; and,

charge dependant impeding means, disposed in the electrolyte and having a constituent thereof bonded to the negative electrodes, for forming a barrier for impeding the gassing charge, the charge dependant impeding means activated by the charging portion corresponding to the gassing charge and being deactivated by the charging portion below the gassing charge such that when activated, the charge dependant impeding means impedes the gassing charge to limit gas generation in the rechargeable electrochemical cell, and when deactivated, the charge dependant impeding means has substantially no charge limiting effect, the charge dependent impeding means being deactivated and having substantially no effect during the discharge cycle.

30. (Previously Presented) The rechargeable electrochemical cell according to claim 29, wherein the charge dependent impeding means is a quaternary ammonium compound selected from the group consisting of alkyl dimethyl benzyl ammonium chloride, didecyl dimethyl ammonium chloride, didecylmethoxyethyl ammonium propionate, pyridine and quinoline.

31. (Previously Presented) The rechargeable electrochemical cell according to claim 29, wherein the charge dependent impeding means is a non-ionic compound selected from the group

consisting of primary, secondary, tertiary, aliphatic and cycloaliphatic amines.

32. (Previously Presented) The rechargeable electrochemical cell according to claim 29, wherein the charge dependent impeding means is sodium dioctyl sulfo succinate.

33. (Previously Presented) The rechargeable electrochemical cell according to claim 29, wherein the charge dependent impeding means is an alkyl dimethyl benzyl ammonium chloride, the alkyl containing from 12 to 16 carbon atoms.

34. (Previously Presented) The rechargeable electrochemical cell according to claim 33, wherein the alkyl dimethyl benzyl ammonium chloride is present in the aqueous electrolyte at from about 5 mg/l to about 1500 mg/l.

35. (Previously Presented) The rechargeable electrochemical cell according to claim 33, wherein the alkyl dimethyl benzyl ammonium chloride is present in the aqueous electrolyte at from about 5 mg/l to about 75 mg/l.

36. (Previously Presented) The rechargeable electrochemical cell according to claim 29 wherein the charge dependant impeding means is soluble in the aqueous electrolyte.

37. (Cancelled)

38. (Cancelled)

39. (Previously Presented) The rechargeable electrochemical cell of claim 29 wherein the rechargeable electrochemical cell is a lead-acid battery.

40. (Cancelled)

41. (Previously Presented) The rechargeable electrochemical cell of claim 29 wherein the charge dependant impeding means contains elements from the fifth or sixth periodic groups.

42. (Presented Presented) A method for reducing water loss due to electrolysis of an aqueous acid electrolyte in a rechargeable electrochemical cell which is subjected to multiple

charging cycles and discharging cycles, each charging cycle having a charging portion corresponding to a gassing charge where hydrogen gas is generated by electrolysis of the aqueous electrolyte and a charging portion below the gassing charge, the rechargeable electrochemical cell having opposed positive and negative electrodes, the aqueous electrolyte in ionic contact with the positive and negative electrodes for supporting current flow therebetween, the method comprising:

providing charge dependant impeding means disposed in the aqueous electrolyte, and bonding a constituent of the charge dependant impeding means to the negative electrodes, for forming a barrier to impede the gassing charge, the charge dependant impeding means being activated by the charging portion corresponding to the gassing charge and being deactivated by the charging cycle portion below the gassing charge, the charge dependent impeding means being deactivated and having substantially no effect during the discharge cycle; and,

applying a charging cycle to the rechargeable electrochemical cell, activating the charge dependent impeding means when a gassing charge is attained, impeding the gassing charge to reduce water loss due to electrolysis.

43. (Previously Presented) A rechargeable electrochemical cell which is subjected to multiple charging cycles and discharging cycles, each charging cycle having a charging portion corresponding to a gassing charge where a gas is generated and a charging portion below the gassing charge, the rechargeable electrochemical cell comprising opposed positive and negative electrodes, an aqueous electrolyte in ionic contact with the electrodes for supporting current flow therebetween, and charge dependant impeding means disposed in the electrolyte and having a constituent thereof attached to the negative electrodes for impeding the gassing charge, the charge dependant current impeding means being activated by the charging portion corresponding

to the gassing charge to impede the gassing charge to reduce gas generation at the negative electrodes, and being deactivated at a charging cycle below the gassing charge to have substantially no charge limiting effect, the charge dependant impeding means when activated forming a barrier over a surface of the negative electrodes to impede ions attracted to the negative electrodes.

44. (Previously Presented) The rechargeable electrochemical cell according to claim 43, wherein the barrier further contains gas bubbles evolved from the negative electrode.

45. (Previously Presented) The rechargeable electrochemical cell according to claim 43 wherein the charge dependant impeding means have head portions attached to the negative electrode surfaces and tail portions extending into the electrolyte away from the head portions.

46. (Previously Presented) The rechargeable electrochemical cell according to claim 43, wherein the rechargeable electrochemical cell is a secondary battery cell.

47. (Cancelled)

48. (Previously Presented) The electrochemical cell according to claim 44, wherein a quantity of gas bubbles contained in the barrier correlates with a strength of impediment to ions attracted to the negative electrode.

49. (Previously Presented) The rechargeable electrochemical cell according to claim 43 wherein the barrier impedes ions selected from the group consisting of lead, antimony, arsenic, tin, iron, zinc, chromium, copper and silver ions.

50. (Currently Amended) The rechargeable electrochemical cell of claim 29 43 wherein the charge dependant impeding means contains elements from the fifth or sixth periodic groups.

51. (New) A rechargeable electrochemical cell which is subjected to multiple charging cycles and discharging cycles, each charging cycle having a charging portion corresponding to a

gassing charge where a gas is generated in the rechargeable electrochemical cell and a charging portion below the gassing charge, the rechargeable electrochemical cell comprising;

opposed positive and negative electrodes, a substantially constant current applied thereto by the charging cycle;

an aqueous electrolyte in ionic contact with the electrodes for supporting current flow therebetween; and,

charge dependant impeding means, disposed in the electrolyte and having a constituent thereof bonded to the negative electrodes, for forming a barrier for impeding the gassing charge, the charge dependant impeding means activated by the charging portion corresponding to the gassing charge and being deactivated by the charging portion below the gassing charge such that when activated, the charge dependant impeding means impedes the gassing charge to limit gas generation in the rechargeable electrochemical cell and raises a voltage across the positive and negative electrodes, and when deactivated, the charge dependant impeding means has substantially no charge limiting effect, the charge dependant impeding means being deactivated and having substantially no effect during the discharge cycle.

52. (New) A rechargeable electrochemical cell which is subjected to multiple charging cycles and discharging cycles, each charging cycle having a charging portion corresponding to a gassing charge where a gas is generated in the rechargeable electrochemical cell and a charging portion below the gassing charge, the rechargeable electrochemical cell comprising;

opposed positive and negative electrodes, a substantially constant voltage applied thereto by the charging cycle;

an aqueous electrolyte in ionic contact with the electrodes for supporting current flow therebetween; and,

charge dependant impeding means having a constituent thereof bonded to the negative

electrodes, for forming a barrier for impeding the gassing charge, the charge dependant impeding means activated by the charging portion corresponding to the gassing charge and being deactivated by the charging portion below the gassing charge such that when activated, the charge dependant impeding means impedes the gassing charge to limit gas generation in the rechargeable electrochemical cell and reduces a current between the positive and negative electrodes, and when deactivated, the charge dependant impeding means has substantially no charge limiting effect, the charge dependant impeding means being deactivated and having substantially no effect during the discharge cycle.